

ABSTRACT

The survival of protected wildlife in Indonesia continues to be threatened by human activities such as deforestation, poaching, and illegal wildlife trade. These threats raise serious concerns regarding biodiversity conservation, which is essential for maintaining ecological balance. To support wildlife preservation efforts, a reliable and accurate monitoring system is needed to detect the presence of protected animals in their natural habitats. This study explores the application of artificial intelligence, specifically object detection methods based on deep learning. The YOLOv11 model was chosen due to its capability to perform fast object detection with high accuracy. The model was implemented to detect various species classified as protected animals. The dataset was collected from multiple online sources and enhanced through data augmentation using Roboflow. The training and testing processes were carried out in Google Colaboratory, and the model's performance was evaluated using Confusion Matrix and Mean Average Precision (mAP) metrics. Evaluation results show that YOLOv11n achieved a precision of 0.938, recall of 0.909, mAP^{50} of 0.955, and mAP^{50-95} of 0.786. These results indicate that the model is capable of serving as an effective automatic detection system to support wildlife monitoring and strengthen conservation efforts in Indonesia.

Keywords: Biodiversity, Confusion Matrix, Mean Average Precision (mAP), Object Detection, Protected Animals, YOLOv11